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# Value Adding Management of buildings and facility services in four steps

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## ABSTRACT

This paper presents a new Value Adding Management (VAM) model that aims to support decision makers in identifying appropriate interventions in buildings, other facilities and services that add value to the organisation, to manage its implementation, and to measure the output and outcomes. The paper builds on value adding management theories and models that use the triplet input-throughput-output, a distinction between output, outcome and added value, and concepts, theories and data on the impact of interventions in corporate real estate and facility services, change management and performance measurement. Furthermore, input has been used from a cross-chapter analysis of a new book in which 23 authors from five different European countries present a state of the art of theory and research on 12 value parameters: satisfaction, image, culture, health and safety, productivity, adaptability, innovation, risk, cost, value of assets, sustainability and Corporate Social Responsibility. The new VAM model follows the steps from the well-known Plan-Do-Check-Act cycle, which are supported by various tools that were found in the literature or came to the fore in the state-of-the-art sections. In order to be able to select appropriate interventions in the Plan-phase, this paper includes a typology of typical interventions in corporate real estate and facility services that may add value to the organisation. The Check-phase is supported by an overview of ways to measure the 12 value parameters and related Key Performance Indicators. The new Value Adding Management model connects Corporate Real Estate Management (CREM) and Facilities Management (FM) with general business management in order to align CREM/FM interventions to the organizational context and organizational objectives. The VAM model opens the black box of input-throughput-output-outcome and is action oriented due to the connection to various management and measurement tools.

**Keywords:** Added value, FM, CREM, Plan-Do-Check-Act, Interventions, KPIs

## INTRODUCTION

If and how buildings, facilities and services can add value to an organisation is subject of ongoing debates within research and practice in both the worlds of Corporate Real Estate Management (CREM) and Facilities Management (FM).<sup>1, 2, 3, 4, 5, 6, 7, 8, 9</sup> In 2009, a EuroFM research group on “The Added Value of FM” started to review the academic knowledge on the added value of FM. The body of knowledge was integrated in a first anthology on the added value of FM in 2012.<sup>10</sup> The driver behind this work was the perception that FM and CREM have gradually shifted from primarily steering on cost reduction towards managing facilities as a strategic resource to add value to the organisation and to contribute to its overall performance. Since this first Anthology, various follow-up steps have been conducted to further increase our understanding of the added value of FM and CREM, see Table 1. The findings confirmed that there still seems to be confusion about the concept of added value and a lack of tools to manage and measure the added value of corporate real estate and facility services. This endorsed the need for a second anthology on adding value by FM and CREM. In this second book, entitled *Facilities Management and Corporate Real Estate Management as Value Drivers: How to Manage and Measure Adding Value*, 23 academics from 5 countries and 13 practitioners from 6 countries share their insights and experiences with adding value by Facilities Management (FM) and Corporate Real Estate Management (CREM).<sup>11</sup>

Table 1: Research on adding value – from book one to book two (selection)

Year	Action	Findings and reference
2012	First Anthology on The added value of FM – Concepts, findings, perspectives.	Academic research on the meaning of added value and value adding management. List of 50 definitions of added value, classified into use/user/customer value, economic/financial/exchange value, social value, relationship value, and environmental value <sup>12</sup>
2012	Setting the research agenda	Overview of relevant research topics found in various reports and in the first Anthology on the added value of FM <sup>13</sup>
2013	Workshop by Jensen, Van der Voordt and Coenen to further discuss “How to manage and measure different value dimensions?”	Attendants interpreted added value in a different way and found it difficult to operationalise added value in clear dimensions, interventions and ways to measure.
2013	Exploration of how FM can add value to organisations as well as to society.	Similarities and dissimilarities in conceptual frameworks on the AV of FM and CREM and related stakeholders. <sup>14</sup>
2014	Interviews with practitioners if/how they apply the added value concept in practice, what values are prioritised, what interventions are implemented, and how the outcomes are measured	User satisfaction, productivity and cost reduction were highly prioritised. There is a need for a coherent definition of added value and appropriate tools to measure different value parameters. <sup>15</sup>
2015	Critical review of 21 papers from EFMC 2013, EFMC 2014 and CIB 2014 on the added value of FM and CREM	Good research to provide empirical evidence, with a focus on the benefits of interventions for particular stakeholders. Lack of integrated analysis including sacrifices (time, money, risks), and which stakeholders benefits most and least of particular interventions. Only few papers discussed the implementation of change. Lack of before-after evaluations. Insufficient building on former research. No consistency in definitions and operationalisations. <sup>16</sup>
2016	New book, entitled “Facilities Management and Corporate Real Estate Management as value drivers: how to manage and measure adding value”, edited by Per Anker Jensen and Theo van der Voordt	Part I opens the black box of input -> throughput -> output -> outcome -> impact/added value by discussing a taxonomy of six types of interventions, the process of aligning facilities to corporate strategies, and 12 value parameters. Part II presents the state-of-the-art of concepts and research findings for each value parameter and ways to manage and measure. Part III

		presents a new Value Adding management model and ends with reflections, conclusions and recommendations. <sup>17</sup>
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This paper presents a Value Adding Management (VAM) model that was developed in part III of the book.<sup>18</sup> The VAM model is based on a review of the literature and a cross-chapter analysis of part II of the new book and aims to support decision makers in identifying appropriate interventions to add value to the organisation, how to manage its implementation, and how to measure the output and outcomes.

## VALUE ADDING MANAGEMENT MODEL

Terms like added value, adding value and value adding management are widely used in business and management literature. The industrial consultant Carlo Scodanibbio<sup>19</sup> calls VAM the philosophy of the second industrial revolution and the guiding light for the year 2000 industries. In manufacturing related literature “Value Adding Management” or VAM is often used in a way close to Lean Management with a focus on eliminating non-value adding or “waste” activities. However, VAM is also seen as part of an overriding strategy, where the corporate mission is *what* and VAM is *how*<sup>20</sup> and “adding value” refers to *why*. The development of a new Value Adding Management model started with a transition of the what-how-why triplet into a simple process model according to the widely used triplet of input-throughput-output and extended by outcome - impact/added value:

Input → Throughput → Output → Outcome → Impact = Added Value

In order to integrate VAM of buildings and facility services in business management and to make the VAM model more instrumental and applicable as a decision-support and management tool, this simple model has been extended to a more elaborated VAM model, see Figure 1. Because the Plan-Do-Check-Act (PDCA) cycle – also known as the Deming cycle - is widely applied to support total quality management, this cycle has been used as a leading principle to elaborate the original, simple VAM model.

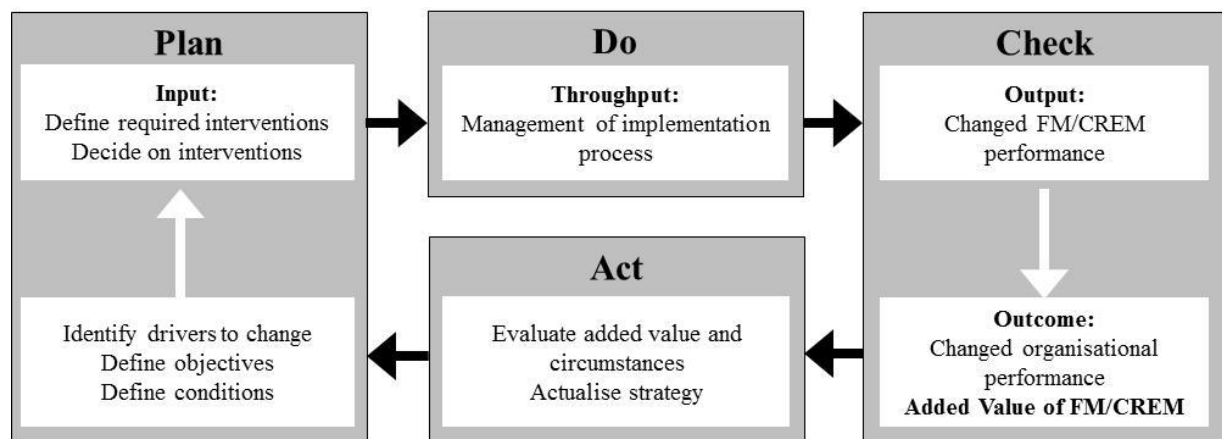


Figure 1: New Value Adding Management model<sup>21</sup>

The cyclic character emphasises that value adding management is or should be a continuous process. Evaluation of realised output/outcome/added value may be a starting point for new interventions.

The VAM model corresponds with some main ideas behind the Accommodation-Choice model<sup>22</sup>. This model has been developed to support decision-makers in creating a successful accommodation policy or an improved work environment that fits with the organisational objectives and internal and external constraints and balances the needs of all stakeholders. The Accommodation-Choice model suggests that each facilities change process should start with identifying *why* an intervention might be needed and what conceptual choices regarding facilities change are expected to optimally facilitate the organisational strategy and current and future user profiles. It also stresses that all steps - from initiation to defining most appropriate interventions, its implementation and after care - require continuous monitoring, evaluation and coordination.

The VAM model also corresponds with the so-called *logic model*, also known as a logical framework or program matrix and theory of change. The logic model has been developed in the early seventies as a tool to evaluate the effectiveness of a program and includes four components<sup>22, 23</sup>:

- Inputs: resources such as money, staff, equipment;
- Activities: the activities that are included in the program e.g. the development of procedures or training programs;
- Outputs: what is produced, for instance documents or the number of people that were trained;
- Outcomes/impacts: the changes or benefits that result from the program, e.g. increased skills of knowledge.

However, what is missing here is a clear link with FM and CREM, a link with organisational objectives is not explicitly mentioned.

The next sections present how current insights and tools can be used to support the four steps of the PDCA-cycle.

## Plan

The main actions in the Plan-phase are to identify the drivers to change i.e. to define if there is a gap between the desired and actual performance of the organisation and the accommodation, facilities and services, and to define which interventions may result in improved performance. The Plan phase ends with clear decisions about which interventions will be implemented and how to implement them. Box 1 presents a typology of six types of CREM and FM interventions that may add value to an organisation:

1. Changing the physical environment (on different scale levels: portfolio, building, space)
2. Changing facilities services
3. Changing the interface with core business
4. Changing the supply chain
5. Changing the internal processes
6. Strategic advice and planning

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**Box 1: Typology of possible CREM and FM interventions to add value to an organisation<sup>25</sup>**

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**1. Changing the physical environment**

The physical environment includes buildings, internal and external spaces, technical services (installations), indoor climate, fitting out, furniture, workplaces, technology, artwork and ambience. Typical examples of changing the physical environment include:

- Moving to another location (new or existing building)
- New building
- Rebuilding, refurbishment or adaptive re-use i.e. conversion to new functions
- Changing workplace layout, e.g. conversion to an activity-based work setting
- Changing appearance, e.g. to support corporate branding

**2. Changing facilities services**

In the European standard on FM taxonomy<sup>26</sup> the facilities services are divided in a) demand related to Space & Infrastructure (including space/accommodation, outdoors, cleaning, workspace and primary activities specific) and b) demand related to People & Organisation (including HSSE (Health, Safety, Security and Environment), Hospitality, ICT (Information and Communication Technology), Logistics, Business Support (Management Support, and Organisation specific). The standardised facility products Space and Workplace are partly overlapping with Changing the physical environment, but the physical environment basically concerns tangible artefacts, while the facilities services mostly concerns intangible service activities.

**3. Changing the interface with core business**

When organisations reach a certain size and complexity, FM and CREM are typically established as separate functions or departments. The interface between the core business and FM/CREM is defined specifically in each organisation and is not static. If the FM/CREM function is successful, it will in many cases get the opportunity to increase its area of responsibility. This is often part of a centralisation of the responsibility from several parts of the core business organisation to the FM/CREM function, thereby creating opportunities for economies of scale and better alignment of Building and Facility services (professional approach towards FM/CREM).

**4. Changing the supply chain**

FM is in most cases organised as a mixture of an in-house FM-function and a number of external providers of facility services, which constitutes a FM supply chain. The situation is to some degree similar for CREM, but the CREM supply chain is more project-related and mostly consists of consultants, designers and contractors. Changes in the supply chain are primarily changes in the delivery process, but they often also have consequences for the incentives for the different parties and the management of the mutual relationships

between the parties. The number of external providers varies a lot depending on the type of company and the sourcing strategies. Outsourcing in FM has over the last decades been constantly increasing in most countries and is a common way to achieve cost reductions and flexibility (or also professional support). Even though the general trend is towards more outsourcing in most countries, there are also many examples of insourcing of former outsourced services.

## **5. Changing the internal processes**

What we deal with here is increasing the efficiency of operational processes within a specific organisation without necessarily changing, neither the product, nor the supply chain. The organisation can be in-house or an external provider. Within management theory and practice there are a number of concepts aimed at increasing productivity and process efficiency, for instance Total Quality Management, Business Process Re-engineering, Benchmarking and Lean Management. Typical elements in such concepts are eliminating waste, implementing new technological solutions and optimising the work flow. Many companies conduct projects by using such concepts and the FM function is often included in the project. Many provider companies also work systematically with developing process innovations. This is also the case for some of the larger in-house organisation. The use of advanced IT systems, FM Information Systems and the use of big data can be very helpful here.

## **6. Strategic Advice and Planning**

Strategic advice and planning are essential elements in the strategic and tactical activities of FM and CREM. The areas for strategic advice and planning can cover many different aspects and they will typically change over time according to what is of strategic importance for the company. A typical area of strategic advice to top management concerns the development of a long-term strategy for the corporate property portfolio. This requires a profound and up to date understanding of the overall corporate strategy to identify the future demand for property and close dialogue with evaluation of options, scenarios and proposals concerning the future supply of property. Another typical area is investment planning and feasibility studies, which concerns decision support on choosing between alternative options for fulfilling a need for changes in the capacity of space or similar. This can for instance be whether the company should extend existing facilities, relocate, build new building, sell or buy property, rent or rent out space.

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End of box 1

It is important to define the objectives of intended interventions in a SMART way (Specific, Measurable, Achievable, Relevant and Time-bound) and to define the conditions or prerequisites that should be taken into account. It is also necessary to make a clear distinction between the organisational strategy and the FM/CREM strategy. Both require a strategic analysis and both may reveal drivers for change. If for example an organisation wants to enhance innovation, it may seem obvious to invest in a new interior design that may stimulate creativity and support exchange of knowledge. However, reducing real estate costs in order to increase the R&D budget might be more effective. This example illustrates that there may be different ways to use FM/CREM as a means to contribute to one or more organisational goals.

### *Tools to identify the need for change, objectives and prerequisites*

Analysing the context of value adding management may start with exploring the different roles, interests and power of stakeholders involved, using stakeholder analysis. It is relevant to make a distinction between external and internal stakeholders and end users.<sup>27</sup> Furthermore a SWOT analysis can be applied to analyse the need and direction for change. It is recommended to conduct a SWOT analysis of both the organisation and the FM/CREM processes and products to identify drivers for change within the domain of FM/CREM.

The value proposition model of Treacy and Wiersema<sup>28</sup> may provide a useful starting point to relate a corporate strategy to particular FM/CREM value parameters. According to this model each organisation should make a fundamental strategic choice to focus on one out of three different value propositions: product leadership, customer intimacy, or operational excellence. This choice influences the selection of FM/CREM value drivers: product leadership stresses the FM/CREM contribution to innovation, whereas customer intimacy demands a focus on customer satisfaction; and operational excellence requires a productivity-oriented approach.

Another framework to support the Plan-phase is the one by Nourse and Roulac<sup>29</sup>. They link nine possible 'driving forces' behind a corporate strategy (e.g. market needs, technology, return on investment) to 7 components of competitive advantage (e.g. attracting and retaining customers, efficient business processes), 8 strategic accommodation choices (e.g. cost reduction, support of human resources, value creation of real estate) and 14 operational decisions (e.g. regarding the location, number of m<sup>2</sup>, ICT, ownership and risk management).

#### *Tools to define required interventions and to select the most appropriate ones*

In the second part of the Plan-phase, the main question is how to translate the strategic focus and smart goals into appropriate and valuable FM/CREM interventions. To identify the most appropriate interventions it is recommended to create a FM/CREM strategy map. This tool, developed by Kaplan and Norton<sup>308</sup>, may help to identify critical success factors within chains of means/ends, which are crucial for adding value as defined in the strategic focus. The Balanced Scorecard<sup>31</sup> is a widely used tool to link strategic analysis to critical success factors and KPIs.

Strategic criteria are a prerequisite to select the most effective FM/CREM interventions, i.e. the option(s) with highest benefits and lowest costs and risks. Decision support tools such as business cases can be used to select the most appropriate interventions and to support decision making processes.

## **Do**

The Do-phase encompasses the implementation of the proposed interventions and management of the change process. Decisions to be made include who should be involved in the process and how, time schedules, how to cope with resistance to change, and how to cope with the different needs of different stakeholders. According to the strategic management model of Johnson et al.<sup>32</sup> the purpose of the Do-phase is to put 'strategy in action'. A major challenge is to keep focus on the initial goals regarding adding specific values. Implementation processes tend to develop their own dynamics, which can easily shift the focus from long-term strategic organisational goals to short-term tactical and operational goals of the participants.

Essential aspects of VAM are the strategic alignment between FM/CREM and the core business, stakeholder management and relationship management. Aligning implies moving in the same direction, supporting a common purpose, being synchronized in timing and direction, being appropriate for the purpose and in a passive sense, the absence of conflict.<sup>33</sup> Figure 2 connects the terms alignment and added value to show that corporate real estate only adds value when it supports the organisational objectives. It shows that alignment of the accommodation and building related facilities and services requires a thorough understanding of the organisational strategy and its structure, culture, primary processes and so on. When



the FM/CREM department develops its mission, vision and strategy, this should be done in connection to the mission, vision and strategy of the organisation. FM/CREM interventions should not only be checked on its impact on FM/CREM performance and organisational performance, but also and in particular on its impact on attaining organisational goals and as such on its adding value to the organisation.

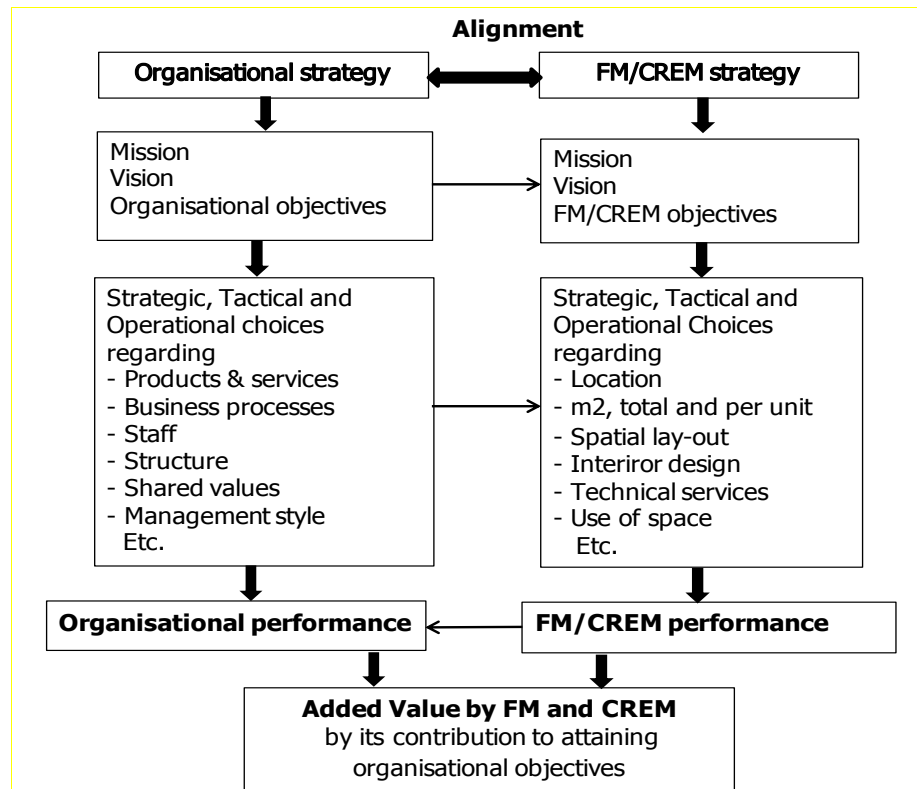


Figure 2: Connections between alignment and adding value<sup>34</sup>

### Tools to support the implementation of change

Change management has evolved as a specialist discipline and has produced many different tools. A tailor-made approach should be designed that fits with the characteristics of the intervention (complexity, budget, risks, time frame), the goals, and the social/organisational context. It is also in the Do-phase recommended to conduct a stakeholder analysis to define who should be involved in the process, in what way, and what their interests are. These stakeholders may or may not be the same as in the Plan-phase. The stakeholder analysis should take into account how different stakeholders perceive change, for instance by using the five-colours framework of De Caluwé and Vermaak<sup>35</sup>. This framework links five different change paradigms to five different management process approaches. Since a change approach has to fit with the expectations and needs of different participants and characteristics and goals of the intervention, it is often wise to combine two or more approaches. A blue-print approach to ensure that a refurbishment project will be finished in time and within budget might for instance be combined with a red-print approach for involving users effectively in the design process.

How to organise change successfully, how to involve the end users, and how to avoid or reduce resistance to change is a major component of any change management approach. According to Kreitner and Kinicki<sup>36</sup> there is no universal strategy for dealing with resistance. However, communication is always essential and should at least include four elements: 1)

inform employees about the change ('what'), 2) inform employees about the rationale underlying the change ('why'), 3) organise meetings for answering questions that employees may have, 4) let employees discuss how the change may affect them. The same principles can be applied to other stakeholders.

## **Check**

In the Check-phase the costs and benefits of the intervention(s) and its impact on the performance of the organisation and its facilities has to be measured, both during the change and ex-post, after the implementation of the intervention(s). To be able to measure whether the performance has been improved, an ex-ante measurement before the intervention is implemented is needed as well (baseline measurement). It is also necessary to evaluate if the changed performance fits with the organisational strategy, mission, vision and objectives and as such adds value to the organisation. For example, if an FM intervention results in a higher ranking on "green buildings" but the organisation was fully satisfied with the original ranking, this higher ranking does not add any value to the organisation. In case of an organisational focus on product leadership, customer intimacy, and the need to cope with the "War on talent", cost reducing interventions that conflict with these prioritised values do not add value in the end either, because the trade-off between benefits and costs will be negative. However, in case of a focus on operational excellence and a good price the same cost reducing interventions may be very appropriate.

### *Tools to check interventions on its aimed outcomes and impact*

Table 2 presents a selection of possible interventions and tools to measure the output and outcomes that came to the fore in part II of the new book. Usually various measuring tools are combined in a so-called Post-Occupancy Evaluation (POE), also called evaluation of buildings-in-use.<sup>37, 38</sup>

Regarding KPIs, a distinction should be made between output indicators to measure FM/CREM performance and outcome indicators to measure organisational performance. Figure 3 shows examples of input -> output -> outcome -> added value chains to illustrate the complexity of cause-effect relationships between interventions, FM/CREM performance, organisational performance and added value.

Table 2: Examples of interventions, assessment methods and KPIs<sup>39</sup>

Value	Interventions	Tools to measure impact	KPIs (Top 3)
Satisfaction	More suitable spatial layout. More collaborative spaces. Better indoor climate.	Employee surveys. Interviews. Walk-throughs.	Employee satisfaction with: - Workplaces - Collaborative space - Indoor environment
Image	Move to a new location. High quality surroundings. Reorganisation of spatial layout.	Stakeholder surveys. Group discussions. Analysis of social media	Perceptions of Corporate identity, Corporate value, Corporate brand
Culture	More open settings to support collaboration. Shared desks/places. New behavioural rules.	Employee surveys. Observations. Interviews. Workshops.	Perceptions of - Corporate culture - Match between culture and work environment
Health & Safety	Higher level of personal control. Ergonomic designed furniture. Better indoor air quality	Capture and react on complaints. Workplace H&S assessment.	Sick leave. Number of accidents. % of satisfied employees.
Productivity	Higher level of transparency to support collaboration. Facilities for concentrated work. Ergonomic furniture.	Observations. Measuring time spent or saved. Employee surveys.	Output per employee. Perceived support of: - Individual productivity - Team productivity
Adaptability	Surplus of spaces, load-bearing capacity, installation capacity, and facilities. Removable and relocatable units and building components.	Building performance assessment, i.e. using Flex 2.0 or Flex 2.0 Light. Observation of adaptations of the building-in-use.	Weighted assessment values, i.e. scores on scales of Flex 2.0 or Flex 2.0 Light.
Innovation and Creativity	Better visibility and overhearing. Different types of meeting spaces and informal areas. Virtual knowledge sharing ICT.	Spatial network analysis. Social network analysis. Logbooks on knowledge sharing activities.	Level of enclosure/openness. Average walking distance. Diversity of workspaces and meeting places.
Risk	Emergency and recovery plans. Back-up supply systems. Insurances.	Measuring time of business interruptions. Measuring risk expenses	Uptime of critical activities. Total risk expenses. Total insurance expenses.
Cost	Cost saving by - Establishing FM department - Process optimization - Outsourcing	Accounting with an appropriate cost structure. Measuring space, number of workstations and f.t.e.	Cost/m <sup>2</sup> , workstation or f.t.e of Total FM, Space, Workplace
Value of Assets	Disposal of CRE. Sale and lease back. Improve owned CRE by adaptive reuse.	Estimate annual potential gross income and annual operational expenses. Market valuation. Estimate cost of new development.	Capitalization. Market value. Cost of new development.
Sustainability	Sustainability framework. Reduction of energy consumption. Reduction of travel and transport activities.	Critical success factors from corporate strategy Survey with multi-criteria scoring methodology Continuous review process.	Consumption of primary energy and water. CO <sub>2</sub> emissions. Access to transport.
Corporate Social Responsibility	Employing challenged workers. Promoting public transport. Circular purchasing model.	Depends on corporate CSR policy and target.	People: diversity of staff Planet: Utilization of space Profit: Total FM/CREM cost

For example, an outdated building or a building that cannot accommodate the growth of a company may be a driver to move to another building (input in first example of Figure 3). The move itself has to be managed and implemented (not shown in Figure 3). If the appearance of the new building or an existing building that is adapted to the requirements of this organisation fits better with the aimed image, this building can contribute to an improved corporate identity (output). This may subsequently lead to an improved organisational

performance regarding an improved brand recognition and a higher market share. Finally, if these positive outcomes support the organisational objectives and the benefits outweigh the costs of moving and possible sacrifices such as longer travel distances for various staff members, the intervention actually adds value to the organisation. Assessing the added value of FM/CREM interventions should not only include ‘objective’ performance measurement and benchmarking, but also a ‘subjective’ evaluation whether the improved performance really is perceived as adding value to the organisation, by the clients, customers and end users, and society.

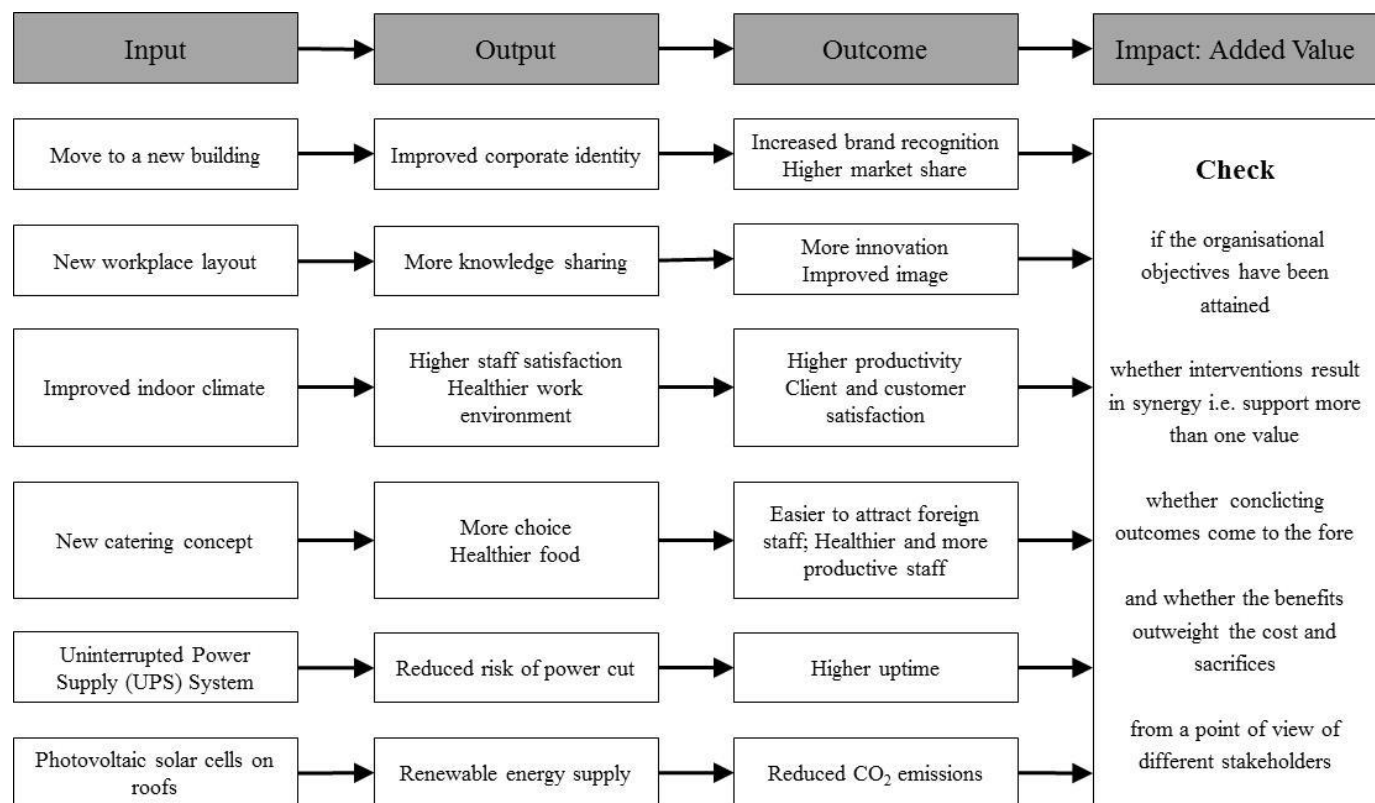


Figure 3: Examples of input -> output -> outcome -> added value chains<sup>40</sup>

A common way to evaluate KPIs is to conduct performance benchmarking internally or with external partners. The benchmarking process can be carried out according to EN15221-7.<sup>41</sup> Benchmarking is an important tool to control cost and to find areas of improvement in FM/CREM, but can also be used to compare other outcomes such as customer satisfaction or employee satisfaction.<sup>42</sup>

## Act

The Act-phase is quite similar to the Plan-phase but starts from a different situation. Whereas the Plan-phase may start with an analysis of changing internal or external circumstances or a strategic analysis of the strengths and weaknesses of the organisation and FM/CREM products and processes, these factors are already taken into account in the Act-phase. When all objectives have been attained and maximum value has been added, the Act-phase may include consolidation of the new situation, until new drivers to change come to the fore. If the objectives are not sufficiently attained or not optimally, or if too many negative side effects come to the fore, new interventions or broadening or strengthening of earlier interventions

should be considered. Another option is to reconsider the objectives. It may happen that the aimed performance was not realistic and feasible within the current conditions. Moreover the context or conditions of the original objectives may be changed, which might force the organization to change its organizational and/or FM/CREM strategy. If new or revised interventions have to be implemented, the Plan- and Do-phases start again.

Box 2 presents a case to briefly illustrate how the four steps can be applied in practice. In addition to illustrate the PDCA-cycle, this case also illustrates that in practice many different terms are used to express the aimed output and outcome of interventions in buildings, facilities and services. None of the added values from the list of 12 value parameters in the new book and listed in Table 2 are mentioned here using the same terminology. However, in terms of Table 2 the underlying aimed added values in this case are to improve teachers' productivity and job satisfaction and to improve service quality and as such indirectly to improve customer satisfaction and school image as well.

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**Box 2: Application of the VAM-model: implementation of a new concept for FM in schools<sup>43</sup>**

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**Plan:**

The driver to facilities change in this case was to relieve the managers and teachers in the school for spending time on support activities and to concentrate on educational activities. The teachers and the managers in the schools had for many years been more and more stressed by new demands and the management had turned into jacks of all trades, who should handle all tasks in and around the school. This led to a project testing the effect of separating the activities into the core business of education and teaching the children and the activities focused on creating the best supportive environment for the primary processes— Facilities Management. The intervention was to transfer the FM-related support staff at the schools to the FM department, who should be in charge of and improve the services and allow the school staff to focus on their core business.

**Do:**

The FM department initiated a pilot project at one school where they created a professional service organisation based on detailed knowledge about the needs of the schools. They established a service reception as the centre of the contact between the school and the service organisation (actually a 'front office'). The reception became a service point where the school managers, teachers and students could receive the help and service they demanded. The FM department trained the support staff to become service and customer oriented as part of the FM team, which could supplement and replace each other. The tasks, which the FM department took over, included guarding, building maintenance, cleaning, taking care of the external and internal environment, administration, procurement, copying, messenger service, etc.

**Check:**

The evaluation of the case showed that the head master of the school had changed his time used on pedagogics versus FM related activities from 60/40% to 85/15%. Furthermore, the status of the teachers had increased, recruiting new teachers had become easier, student satisfaction had risen, and a better physical environment with fewer complaints about environment and cleaning, reduced sickness, better service for the same money and an improved maintenance of the buildings had been achieved. Formerly the support staff was a group with low priority in the schools and by transfer to the FM department they were upgraded and offered more varied tasks. The introduction of FM also had as a result that the schools got more positive instead of negative publicity in the local press and the outside world.

**Act:**

Based on the results of the pilot project the municipality decided that the FM department should implement the new FM concept in all schools in the municipality. Agreements were made with each school in which responsibility and quality and amount service deliveries to the school in question were specified together with agreed development goals.

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End of box 2

## CONCLUDING REMARKS AND FUTURE PERSPECTIVES

In this paper the simple input-throughput-output view on adding value by CREM and FM has been elaborated into a more sophisticated Value Adding Management model to make the VAM cycle more instrumental and applicable in practice. The model integrates available tools in a clear step-by-step approach. Besides it makes a clear distinction between FM/CREM performance (output) and the contribution of FM/CREM to organisational performance (outcome). As such it may help to explore of various interventions in connection to organisational objectives (added value)

In order to be able to define the added value of an intervention by FM/CREM, it is important to measure the outcomes and impact of any intervention, ex-post and preferably also ex ante, as input to a business case.<sup>44</sup> Clear performance indicators make it possible to assess how well people or facilities perform. The outcomes can provide the inspiration to achieve higher levels of effectiveness, efficiency, quality, and competitiveness in an ever changing society. As such, performance measurement is an important aid for making judgments and decisions, which can help managers to answer five important questions: 1) where have we been; 2) where are we now; 3) where do we want to go; 4) how are we going to get there; and 5) how will we know that we got there.<sup>45</sup> Besides the need to operationalise the various value parameters in SMART performance indicators), performance measurement should be precise about the performance of *what*, e.g. people, facilities, or services.

Apart from clear performance indicators, it is also important to be able to define the causes of high or low performance, and to understand which changes are needed to improve a specific kind of performance. De Vries et al.<sup>46</sup> concluded that cause-effect relationships are difficult to prove, due to the impact of many interrelated input factors, and the way interventions are implemented. It is an ongoing challenge to further assess the 12 selected value parameters on what we know, what we still need to know, and what Key Performance Indicators could be applied to measure the different added values. An interesting next step could be to explore the similarities and dissimilarities between various FM/CREM models and generic management models and to integrate “the best of” into the new VAM model. This requires intensive collaboration with other support functions and knowledge fields such as HR, ICT, Finance, Marketing and PR. Another next step could be to connect the tools to measure FM/CREM and organisational performance and related KPIs that are presented in Table 2 with other lists of KPIs such as the ones mentioned by Lindholm and Nenonen<sup>47</sup> and Lavy et al.<sup>48, 49</sup>. A third topic for future research is to further elaborate input -> output -> outcome -> added value relationships, to explore which interventions add most value and why, and to integrate current qualitative and quantitative data-collection methods to get clear and evidence-based pictures.

## REFERENCES

- 1) Nourse, H.O. and Roulac, S.E. (1993) ‘Linking real estate decisions to corporate strategy’. *Journal of real Estate Research* (8) 4, pp. 475-494.
- 2) Krumm, P., Dewulf, G. and de Jonge, H. (1998) “Managing key resources and capabilities: pinpointing the added value of corporate real estate management”. *Facilities*,. 16 No. 12, pp. 372-379.
- 3) Lindholm, A.L. and Levainen, K.I. (2006) “A framework for identifying and measuring value added by corporate real estate”, *Journal of Corporate Real Estate*. 8 No. 1, 38-46.

- 4) De Vries, J.C., De Jonge, H. and Van der Voordt, T. (2008) "Impact of real estate interventions on organisational performance". *Journal of Corporate Real Estate* 10 no. 3, 208-223.
- 5) Jensen, P.A., Nielsen, K. and Nielsen, S.B. (2008) *Facilities Management Best Practice in the Nordic Countries – 36 cases*. Centre for Facilities Management – Realdania Research, DTU Management Engineering. Technical University of Denmark.
- 6) Jensen, P.A. (2010) "The Facilities Management Value Map: a conceptual framework". *Facilities* 28 no. 3/4, 175-188.
- 7) Den Heijer, A.C. (2011), *Managing the university campus*. PhD thesis. Delft: Eburon.
- 8) Riratanaphong, C. (2014) *Performance measurement of workplace change in two different cultural contexts*. PhD thesis. Faculty of Architecture, Delft University of Technology.
- 9) Van der Zwart, J. (2014) *Building for a better hospital. Value-adding management & design of healthcare real estate*. PhD thesis. Faculty of Architecture, Delft University of Technology.
- 10) Jensen, P.A., van der Voordt, T., and Coenen, C. (eds) (2012), *The Added Value of Facilities Management: Concepts, Findings and Perspectives*. Lyngby, Denmark: Centre for Facilities Management & Polyteknisk Forlag.
- 11) Jensen, P.A. and Van der Voordt, T. (eds.) (2016), *Facilities Management and Corporate Real Estate Management as Value Drivers: How to Manage and Measure Adding Value*. Oxfordshire: Routledge.
- 12) Jensen et al., reference 10 above.
- 13) Jensen, P.A., van der Voordt, T., Coenen, C., von Felten, D., Lindholm, A., Balslev Nielsen, S., Riratanaphong, C. and Schmid, M. (2012) "In Search for the Added Value of FM: What we know and what we need to learn". *Facilities* 30 no. 5/6, 199-217.
- 14) Jensen, P.A., Sarasoja, A.L., Van der Voordt, T. & Coenen, C. (2013) "How can Facilities Management add value to organisations as well as to society?" Brisbane, Australia: *CIB World Building Congress*, 5-9 May 2013.
- 15) Van der Voordt, T. and Jensen, P.A. (2014), Adding value by FM: exploration of management practice in the Netherlands and Denmark. *EFMC 2014*, Berlin, 4-6 June 2014.
- 16) Jensen, P.A. and Van der Voordt, T. (2015) *How can FM create value to organisations. A critical review of papers from EuroFM Research Symposia 2013-2015 papers*. Baarn: EuroFM publication.
- 17) Jensen et al., reference 11 above.
- 18) Hoendervanger, J.G., Bergsma, F., Van der Voordt, T. and Jensen, P.A. (2016) "Tools to manage and measure adding value by FM and CREM". In: Jensen, P.A. and Van der Voordt, T. (eds.), *Facilities Management and Corporate Real Estate Management as Value Drivers: How to Manage and Measure Adding Value*. Oxfordshire: Routledge.
- 19) Scodanibbio, C. (2014): *Training programme – Value Adding Management*. [www.scodanibbio.com](http://www.scodanibbio.com) (accessed 3 September 2014).
- 20) Anonymous (2014) *Value Adding Management*. Book chapter - no author and book title indicated.
- 21) Hoendervanger et al., reference 18 above.
- 22) Van der Voordt, D.J.M., Ikiz-Koppejan, Y.M.D. and Gosselink, A. (2012) 'Evidence-Based Decision-Making on Office Accommodation: Accommodation Choice Model'. In: Mallory-Hill, S., W.F.E. Preiser, W.F.E. and Watson, C. (eds), *Enhancing Building Performance*. Chichester, UK: Wiley-Blackwell, pp. 213-222.
- 23) Weiss, C.H. (1972) *Evaluation Research. Methods for Assessing Program Effectiveness*. Prentice-Hall, Inc., Englewood Cliffs, New Jersey.
- 24) Newcomer, K., Hatry, H.P. and Wholey, J.S. (2012), *Handbook of Practical Program Evaluation*. New York: Jossey-Bass. 4<sup>th</sup> edition.
- 25) Jensen, P.A. and Van der Voordt, T. (2016) Towards an integrated Value Adding Management Model for FM and CREM. In: Nenonen, S. and Junnonen, J-M. (eds.) *WBC16 Proceedings Volume IV: Understanding Impacts and Functioning of Different Solutions*. CIB World Building Congress 2016: Intelligent Built Environment for Life. May 30 - June 3, Tampere, Finland, pp. 332-344.
- 26) CEN (2011) *Facility Management – Part 4: Taxonomy of Facility Management – Classification and Structures*. European Standard EN 15221-4. European Committee for Standardization.

- 27) Ambrosini, V.R., Johnson, G. and Scholes, K. (1998) *Exploring techniques of analysis and evaluation in strategic management*. Harlow: Prentice Hall.  
<http://www.productivity.in/knowledgebase/Material%20Management/Value%20adding%20management.pdf> (accessed 3 September 2014).
- 28) Treacy, M. and Wiersema, F. (1995), *The discipline of market leaders*. Massachusetts USA: Addison Wesley.
- 29) Nourse and Roulac, reference 1 above.
- 30) Kaplan, R.S., and Norton, D.P. (2004), '*Strategy maps: converting assets into tangible outcomes*', Massachusetts, USA: Harvard Business School Publishing.
- 31) Kaplan, R.S., and Norton, D.P. (1992) '*The balanced scorecard – measures that drive performance*', *Harvard Business Review* (70) 1, pp. 70-80.
- 32) Johnson, G., Scholes, K. and Whittington, R. (2009) *Fundamentals of Strategy*, Pearson Education Ltd.
- 33) Then, D.S.-s., Tan, T.-h., Santovito, R.S. and Jensen, P.A. (2014) 'Attributes of Alignment of Real Estate and Facilities Management to Business Needs – an international comparative analysis', *Journal of Corporate Real Estate* 16 (2), pp. 80-96.
- 34) Van der Voordt, T. (2014), *Adding Value by Corporate and Public Real Estate*. Position paper. Delft: Delft University of Technology, Faculty of Architecture.
- 35) De Caluwé, L. and Vermaak, H. (2003) *Learning to change: a guide for organization change agents*, Sage Publications Inc.
- 36) Kreitner, R. and Kinicki, A. (2007) *Organisational Behaviour*. New York: McGraw Hill, seventh edition.
- 37) Preiser, W. and Visscher, J. (eds.) (2004) *Assessing Building Performance*. Oxford, UK, Elsevier.
- 38) Van der Voordt, T. J. M., De Been, I. and Maarleveld, M. (2012) 'Post-Occupancy Evaluation of Facilities Change'. In: E. Finch (ed), *Facilities Change Management*. Chichester, West Sussex: Wiley-Blackwell, pp. 137-154.
- 39) Adopted from Hoendervanger et al., reference 18 above.
- 40) *Ibid.*
- 41) CEN (2012) *Facility Management – Part 7: Guidelines for Performance Benchmarking*. European Standard EN 15221-7. European Committee for Standardization.
- 42) Maarleveld, M., Volker, L., and Van der Voordt, T.J.M. (2009) 'Measuring employee satisfaction in new offices – the WODI toolkit', *Journal of Facilities Management* 7, 3, pp. 181-197.
- 43) Adopted from Jensen et al., reference 5 above.
- 44) Van der Zwart, J. and Van der Voordt, T. (2015), Adding value by hospital real estate – An exploration of Dutch practice. *Health Environments Research & Design Journal*, pp.1-16.
- 45) Lebas, M. J. (1995) 'Performance measurement and performance management', *International Journal of Production Economics*, 41, 23-35.
- 46) De Vries et al., reference 4 above.
- 47) Lindholm, A.I. and Nenonen, S. (2006) 'A conceptual framework of CREM performance measurement tools'. *Journal of Corporate Real Estate* (8) 3, pp. 108-119.
- 48) Lavy, S., Garcia, J.A. and Dixit, M. (2010) Establishment of KPIs for facility performance measurement: Review of Literature. *Facilities* (28) 9, pp. 440-464.
- 49) Lavy, S., Garcia, J.A. and Dixit, M.K. (2014), KPIs for facility's performance assessment. Part I: Identification and categorization of core indicators. Part II: Identification of variables and deriving expressions for core indicators. *Facilities* (32) 5/6, pp. 256-274 and 275-294.



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